STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Division of Fish and Wildlife
Marine Fisheries

2005
Management Plan for the
Crustacean Fishery Sector

developed in association with the
commercial fishing licensing provisions set forth in the
“Rules and Regulations Governing the Management of Marine Fisheries”

December 13, 2004

AUTHORITY: These regulations are adopted pursuant to Chapters 42-17.1 ”DEM”, Section 20-1-4 and 20-2.1-9(5), in accordance with 42-35, of the Rhode Island General Laws of 1956, as amended.

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RULE 1
PURPOSE The purpose of this Management Plan is to comply with the requirement of 6.2 of the "Rules and Regulations Governing the Management of Marine Fisheries". The objective of which is to achieve the optimum yield from each fishery on a continuing basis while maintaining self-sustaining stocks of all marine species, and to restore overfished stocks to sustainable levels.
RULE 2
AUTHORITY These Management Plans are promulgated pursuant to Chapter 42-17.1"DEM", and Section 20-1-4 and 20-1.1-9(5), in accordance with Chapter 42-35, Administrative Procedures, of the Rhode Island General Laws of 1956, as amended.
RULE 3
APPLICATION The terms and provisions of these Management Plans shall be liberally construed to permit the Department to effectuate the purposes of state law, goals, and policies.
RULE 4
REGULATIONS See below
RULE 5
SEVERABILITY
If any provision of these Rules and Regulations, or the application thereof to any person or circumstances, is held invalid by a court of competent jurisdiction, the validity of the remainder of the Rules and Regulations shall not be affected thereby.
RULE 6
SUPERSEDED RULES and REGULATIONS Erlid#(#2779) On the effective date of this Management Plan, all previous Management Plans of said species resulting from the requirement of 6.2 of the "Rules and Regulations Governing the Management of Marine Fisheries", shall be superseded, provided that Management Plan promulgated by the Director or the RI Marine Fisheries Council will remain in effect until amended or replaced. Provided, furthermore, that any enforcement action taken by, or application submitted to, the Department prior to the effective date of this Management Plan shall be governed by the Management Plan in effect at the time the enforcement action was taken or application was filed.

RULE 7
EFFECTIVE DATE

The foregoing rules after due notice, are hereby adopted and filed with the Secretary of State this 13th day of December 2004 to become effective 20 days from filing, unless otherwise indicated, in accordance with the provisions

_____
Director

Notice Given: 9/4/04
Public Hearing: 10/4/04

Filing date: 12/13/04
Effective date: 20 days from filing

Rhode Island Crustacean Fishery Management Plan 2005

Lobster Endorsement:

Stock Status and Rebuilding Potential- The lobster resource in Narragansett Bay and Rhode Island coastal waters has been over exploited for some time (ASMFC 1996, 2000, Gibson 2000). A recent stock decline prompted the Atlantic States Marine Fisheries Commission (ASMFC) in 2002 to initiate remedial action in management area 2 which includes Rhode Island state waters. An ASMFC subcommittee of stock assessment scientists was convened to examine the problem and in January of 2003, issued a report that recommended reducing lobster landings in area 2 by 73% (ASMFC 2003a). In February 2003, the ASMFC adopted an accelerated gauge increases schedule for Area 2 by emergency action. In addition, addendum IV to the ASMFC lobster fishery management plan was authorized by the management board and adopted in the fall of 2003 with an implementation date of June 1, 2005. Important elements of the addendum IV include increases in minimum legal size, increases in escape vent dimensions, and an effort control program based on trap transferability. The State of Rhode Island conducted public hearings in June of 2004 on the addendum. Additional guidance to the state from the ASMFC was provided at the August 2004 management board meeting. It was determined that additional work was needed on the effort control plan before implementation could occur. That work will be conducted in concert with industry and will take account of the most recent stock assessment.

Agency trawl survey data clearly demonstrate the abundance decline that is of concern to the ASMFC. Rhode Island Division of Fish and Wildlife (RIDFW) surveys conducted in Narragansett Bay and Rhode Island coastal waters in 2004 caught more lobster than a year ago but abundance has not recovered to former levels (Figures 1 and 2). The decline in abundance of recruit and legal lobster from 1997 to 2002 was preceded by a steep decline in abundance of newly settled juveniles from 1990 to 1996 (Figure 3). These observations are consistent with the generally accepted time lag of 6-7 years between settlement and attainment of legal size. These data indicate that weakening recruitment at the youngest benthic stage began early in the decade well before the North Cape oil spill (1996) and outbreak of shell disease (1997). It is not clear why recruitment declined but the decline was coincident with over fishing of adults (ASMFC 2000). Shell disease and increasing predation by finfish are likely additional contributors to the reduced performance of the fishery in recent years (Figure 4). It is worth noting that juvenile settlement improved to average levels in 1997-1999 (Figure 3). Given the time lag from settler to adult, an increase in legal abundance is likely in 2004-2006. Increased catch rate of short lobster in agency trawl surveys and the fishery in 2003-2004 is encouraging.

The ASMFC lobster technical committee is updating the coast wide lobster stock assessment including evaluation of new models and natural mortality rates. The assessment should be finished for peer review in winter of 2005. To support Rhode Island 2005 licensing recommendations as required under RIGL 20-2.1-9, the Gibson (2000) biomass dynamic model (BDM) assessment for the Rhode Island area was updated. This

is a preferred method to assess age uncertain stocks. In addition to estimating stock size and fishing mortality rates, BDM estimates biological reference points based on maximum sustainable yield (MSY). Data required are a time series of fishery landings and a biomass index along with any auxiliary estimates of F or stock biomass to tune the model. Biomass dynamic models are a mass balance approach in which stock biomass in a new year is the sum of last year's biomass plus new production minus the catch removed (Hilborn and Walters 1992). New production is the net balance between additions from growth and recruitment and natural losses. Application of the BDM to data for the Rhode Island inshore lobster fishery revealed that fishing mortality rate (F) has declined in recent years (Figure 5). Landings for 2004 are not yet known so the 2003 estimate of F is the most reliable and is close to that needed for MSY. The recent decline in F is consistent with data showing that fishing effort is declining (Figure 6). Stock biomass, while trending upward recently, remains well below that needed for MSY (Figure 7). Hence, the fishery is classified as over fished. Projections of stock size into the future indicate that the stock cannot rebuild to the MSY level under current F in a reasonable time period (Figure 8). More rapid stock rebuilding to B_{msy} is possible if F is reduced below current levels (Figure 9). The stock status and rebuilding conclusions were robust to consideration of increasing natural mortality rate in lobster. If lobster stock productivity has been reduced by increasing natural mortality, reductions in fishing mortality rate need to be greater to improve resource condition.

Management Program- Lobsters are managed within state waters by the Rhode Island Department of Environmental Management (RIDEM) with advice from the Rhode Island Marine Fisheries Council and RIDFW. Regional management of the lobster resource is the responsibility of the ASMFC. Amendment 3 to the fishery management plan (ASMFC 1997) and associated addenda govern the interstate management program and a peer reviewed coast wide stock assessment (ASMFC 2000) provides information on lobster biology and resource status. The ASMFC management program is organized by lobster management area with Rhode Island state waters part of Area 2. RIDEM complies with the Area 2 plan through a set of management measures that includes minimum gauge and escape vent sizes, trap limits, and protection of egg-bearing females. Both state (RI-MA) and federal waters are included in Area 2 making cooperative management essential. The plan for Area 2 required a reduction in trap deployment to 800 in addition to a set of gauge and escape vent size increases in order to rebuild egg production to the F10% level. As noted above, these measures have been augmented with additional restrictions via the ASMFC addendum process. Notably, the current minimum gauge size of 3-3/8" is scheduled to rise to 3-1/2" by 2008 and a transferability based effort reduction program is expected to reduce the amount of traps deployed over time. Details of the program are contingent on the forthcoming coast wide lobster stock assessment.

Fishery Management Goals and Objectives -

Goal- The following goal is adapted from the coast wide goal of the Atlantic States Marine Fisheries Commission (ASMFC 1996).

> *Rhode Island will have a healthy American lobster resource and a fishery management regime which provides for sustainable harvest, cooperative management by stakeholders, and appropriate opportunities for fishery participation*.

Objectives-

1. Maintain fishing mortality rates and brood stock abundance at levels which minimize the risk of stock depletion and recruitment failure.
2. Extend size-age composition of the resource and increase yield per recruit in the fishery while maintaining harvest at a sustainable level.
3. Maintain existing social and cultural characteristics of the fishery wherever possible
4. Promote economic efficiency in harvesting and use of the resource
5. Provide for adaptive management that is responsive to unanticipated short term events or circumstances.
6. Increase understanding of American lobster biology and improve data collection, stock assessment models, and relationships between harvesters and scientists.

Licensing Options and Recommendations-

Current Rhode Island lobster fishers in state waters must hold multipurpose or lobster principal effort fishing licenses to fish at full levels as allowed for by existing state and ASMFC regulations. A limited number of individuals were issued limited access, basic harvest licenses in 2003. These licenses allowed for a 100 pot deployment rather than the 800 pot, full access deployment. The licensing statutes require that the Director of DEM specify by rule the status of the lobster resource each year and the availability of new lobster licenses.

Recommendations- It is clear from the above information that the local lobster resource is over fished and has undergone a decline in abundance and fishery performance. Recently, the stock has shown signs of increase but biomass remains well below that needed for MSY. The regional rebuilding effort undertaken by the ASMFC has not yet been completed. Additional restrictions will be placed on existing fishers in 2005-2006 via Addendum IV to the interstate fishery management plan. The finding of over fished resource status (biomass below MSY level) is inconsistent with Rhode Island fishery conservation standard A of RIGL 20-2.1-9. Accordingly, it is recommended that no new lobster licenses be issued for 2005. The state should continue to work with the RIMFC and ASMFC to further reduce fishing mortality and to rebuild the lobster resource throughout the region. Attrition is clearly occurring in the industry and contributing to reduced fishing effort. The state should act to neutralize latent effort so that it cannot

activate when resource conditions improve. A prospective control date that limits future participation based on historical performance may be required to deal with latent effort. When stock status warrants, exit-entry ratios for licenses should be developed in consultation with industry and the RIMFC.

Other Management Considerations -

Industry is working closely with the ASMFC and RIDFW to improve the effort control program and resolve the problems identified by the board. Continued agency/industry cooperation is needed as implementation of transferability and historic participation schemes proceeds throughout the region. These programs, although controversial in some quarters, provide the best long-term mechanism to reduce lobster fishing effort. Industry has also expressed support for continuation and expansion of the North Cape v-notching program. Egg production by v-notched females is believed to be a substantial component of local egg production in recent years. Evaluation of this program in the context of ASMFC stock rebuilding targets should occur. RIDFW has committed to a review of escape vent selectivity in particular, studies being conducted by industry. Upon review, recommendations will be made to ASMFC as appropriate. Finally, industry supports development of an un-vented trap survey to replace trawl surveys as the primary abundance monitoring tool for lobster. While planning with industry has occurred, lack of a dedicated funding source is preventing RIDFW from conducting such a survey.

Other Crustacean Endorsement:

Stock Status- The commercial crab fishery in state waters is relatively small with landings of green, Jonah, rock, and blue crabs being made. The horseshoe crab, although not a true crab, is also harvested. Total Rhode Island landings of these species is currently about 3 million pounds and worth about 2 million dollars. However, only a small amount of this is taken from state waters. Landings of deep sea red crabs are also made but these come strictly from federal waters and participation is limited by federal permit. The various local crab stocks are not routinely assessed by the RIDFW but above average trawl survey abundance and increasing landings suggest a sustainable fishery (Figure 10). Horseshoe crabs in Rhode Island were found to be over fished and at low abundance in the first RIDFW assessment (Gibson and Olszewski 2001). A commercial quota system with additional seasonal harvest restrictions has been instituted and landings have been reduced. An update of the stock assessment shows that while fishing mortality rate has been reduced to below the MSY reference point, stock abundance has not yet recovered toward MSY (Figures 11 and 12).

Management Program- Horseshoe crabs and crustaceans other than lobster are managed in state waters by the Department of Environmental Management with advice from the Rhode Island Marine Fisheries Council. The Department uses minimum sizes, seasons, quotas, and possession limits to manage the state waters fishery.

Fishery Management and Licensing Recommendations- No changes are recommended to the management program for horseshoe crabs and crustaceans other than lobster. Crab landings and abundance are following increasing trends and no new restrictions are needed. The spawning period closures have greatly restricted the horseshoe crab fishery and reduced fishing mortality rates. No additional limits are needed at this time. New commercial licenses for these species need not be limited and can have harvest levels equal to current licensees.

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Gibson, M.R. 2000. Alternative assessment and biological reference points for the Rhode Island inshore lobster stock with estimations of unfished stock size. Report to the Atlantic States Marine Fisheries Commission and lobster assessment peer review panel.

Gibson, M.R., and S. Olszewski. 2001. Stock Status of Horseshoe Crabs in Rhode Island in 2000 with Recommendations for Management. RI Division of Fish and Wildlife. Research Reference Document 01/01**.**

Hilborn, R., and C.J. Walters. 1992. Quantitative fisheries stock assessment choice, dynamics and uncertainty. Chapman and Hall, New York. 570 p.

Fig.1- Lobster Abundance Indices by Size Class from the RIDFW Spring Trawl Survey

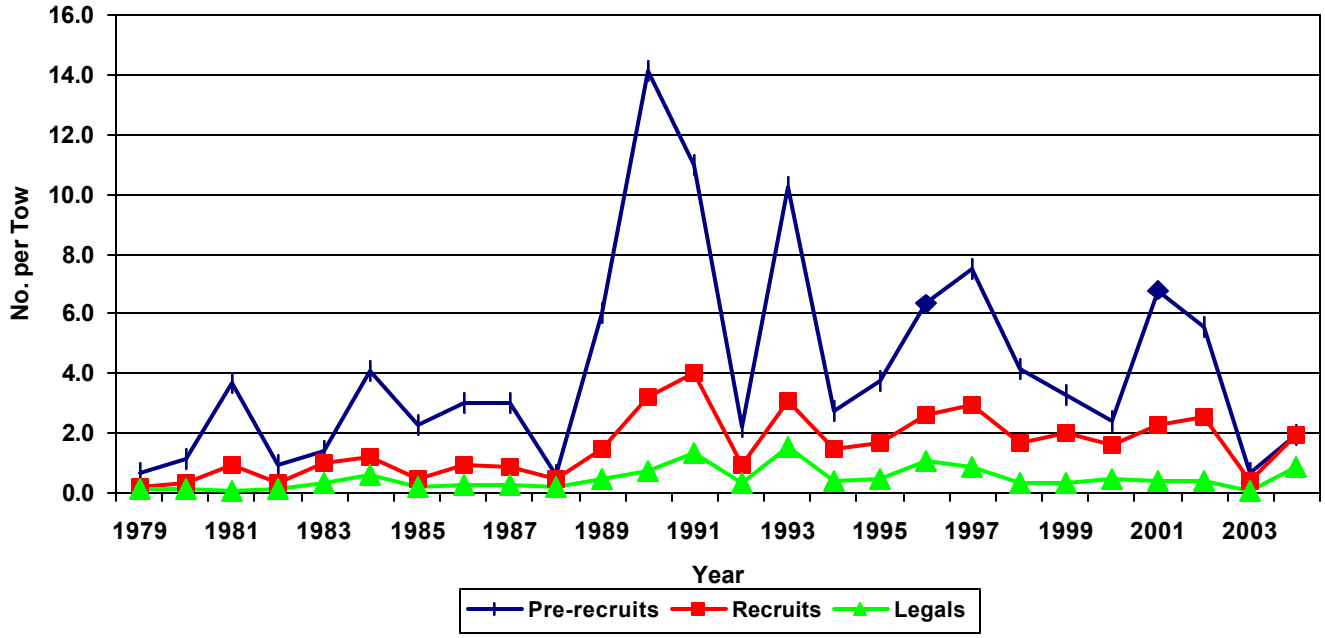

Fig.2- Lobster Abundance Indices by Size Class from the RIDFW Fall Trawl Survey

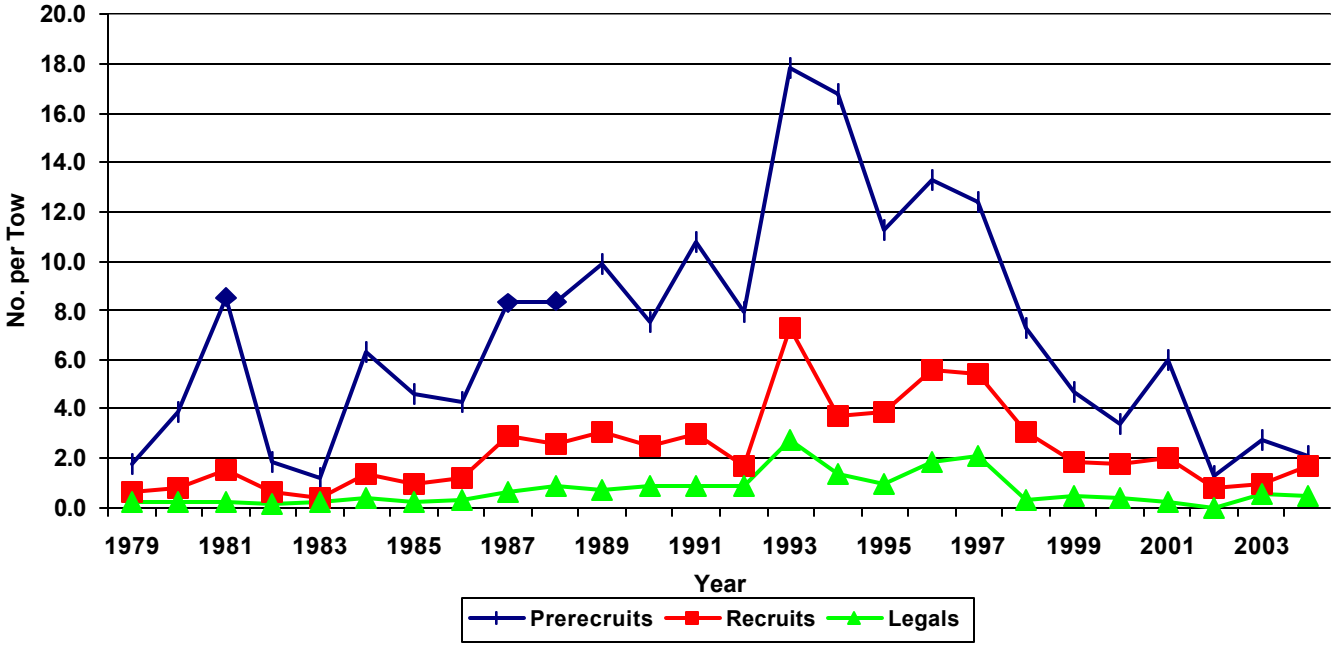

Figure 3- Abundance of Newly Settled Lobster in Rhode Island from Dive Sampling

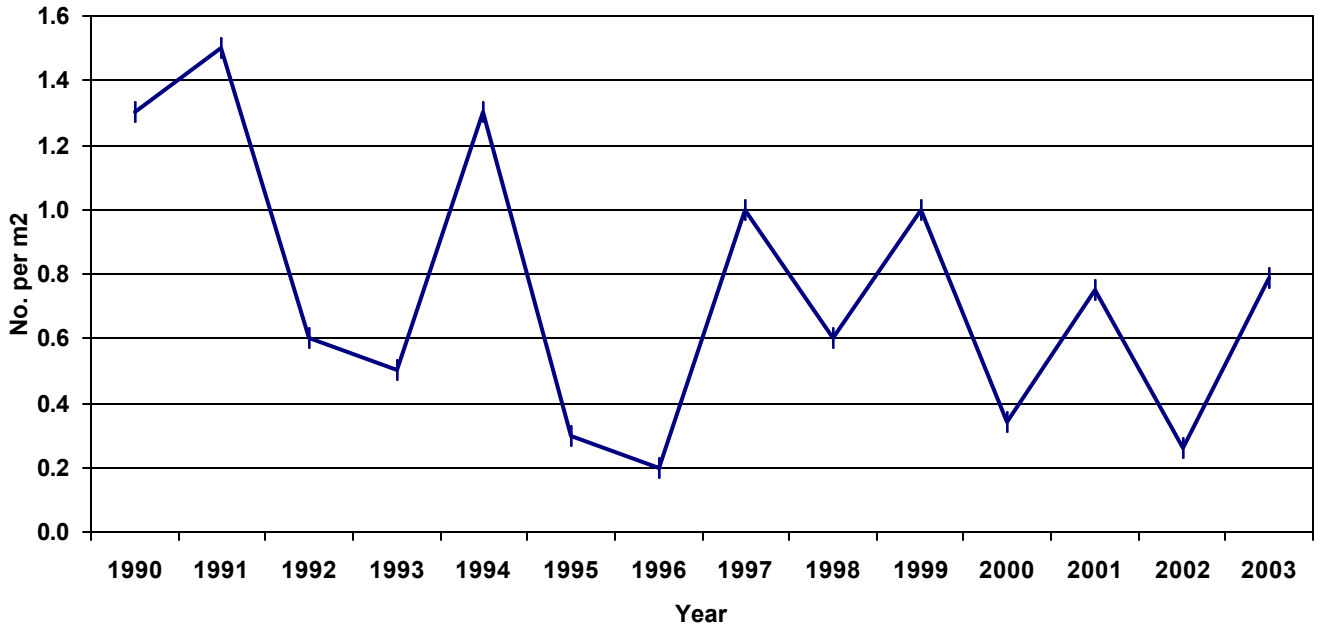

Figure 4- RI Inshore Lobster Landings and Fishery Catch per Unit Effort

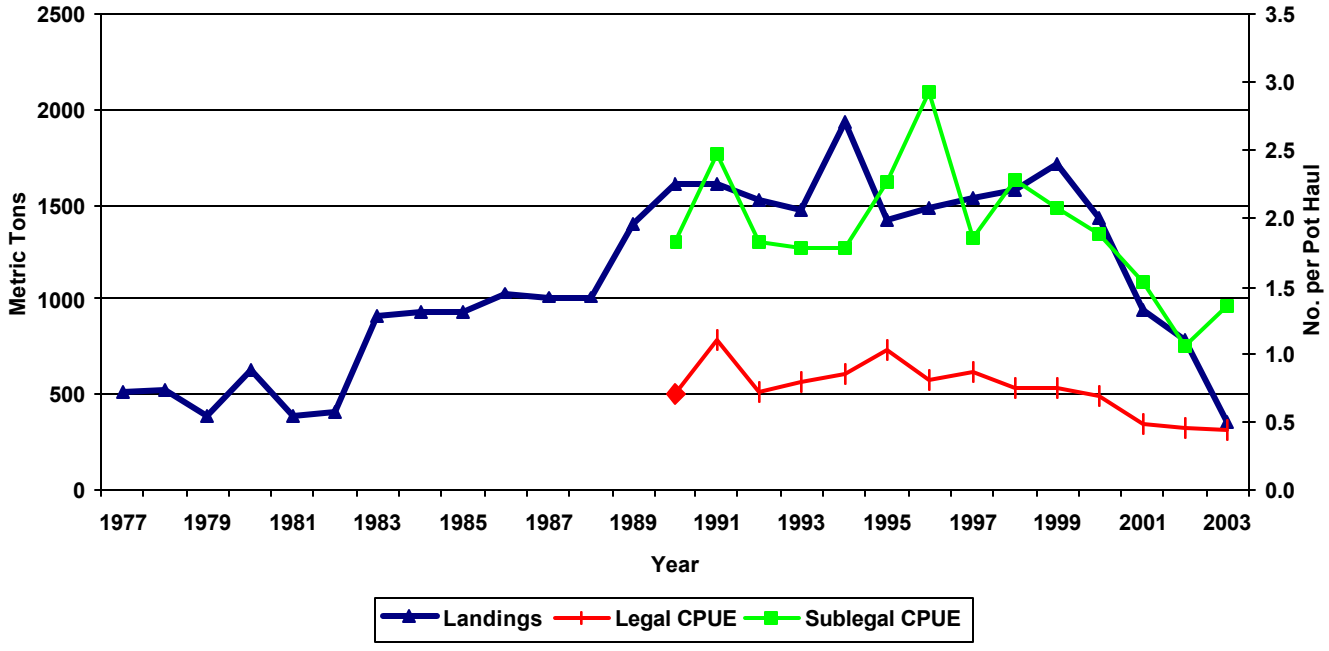

Fig.5- RI Inshore Lobster Fishing Mortality Rate from BDM Model Compared to MSY Level

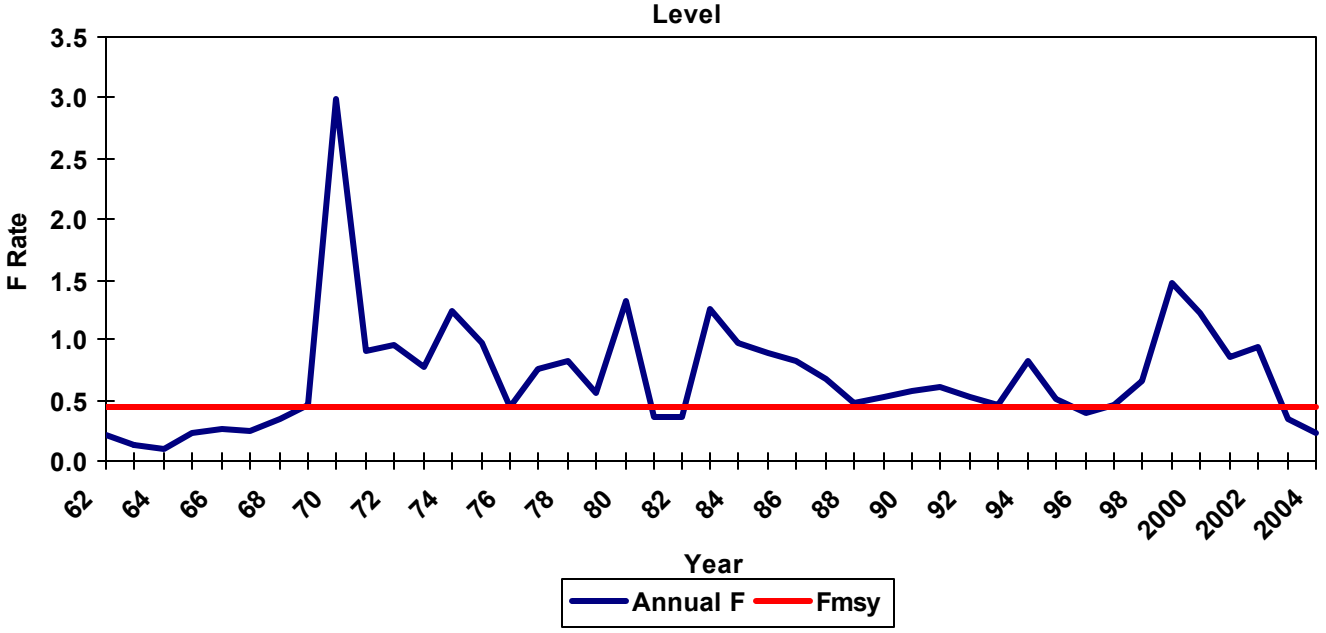

Fig.6- Number of Pots Fished from DFW Logbooks and Computed Pot-Hauls from Landings and Sea Sample CPUE

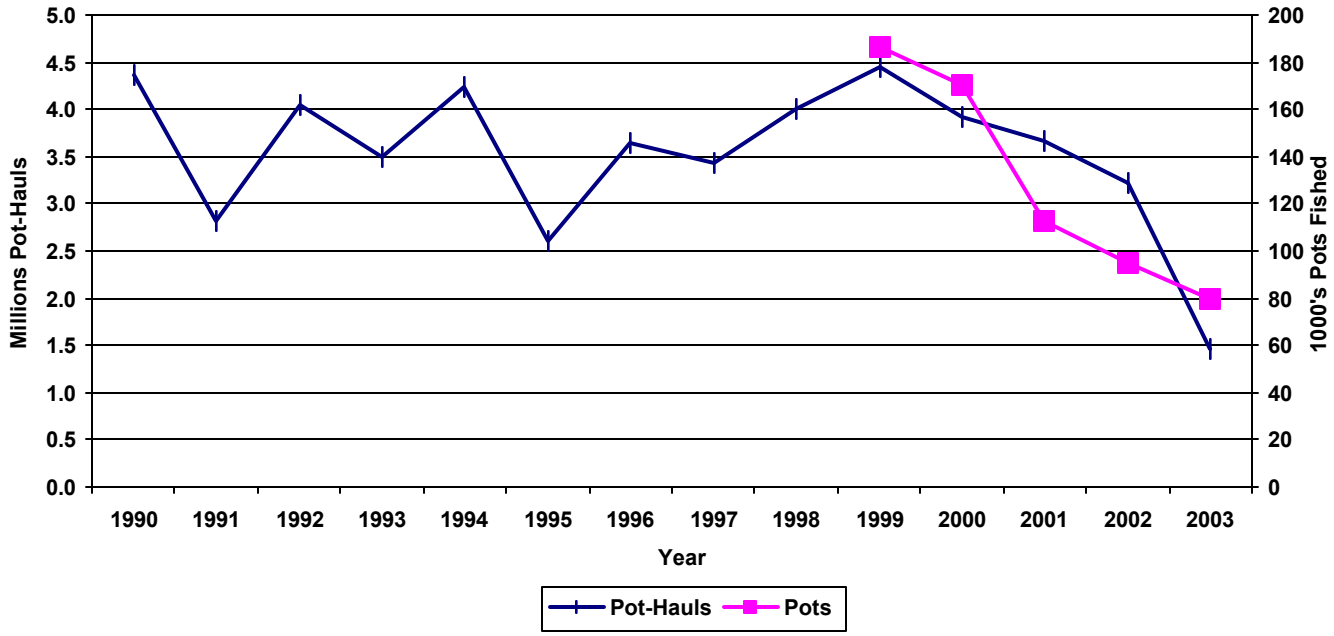

Fig.7- RI Inshore Lobster Absolute Abundance and Landings from BDM Model Compared to Bmsy

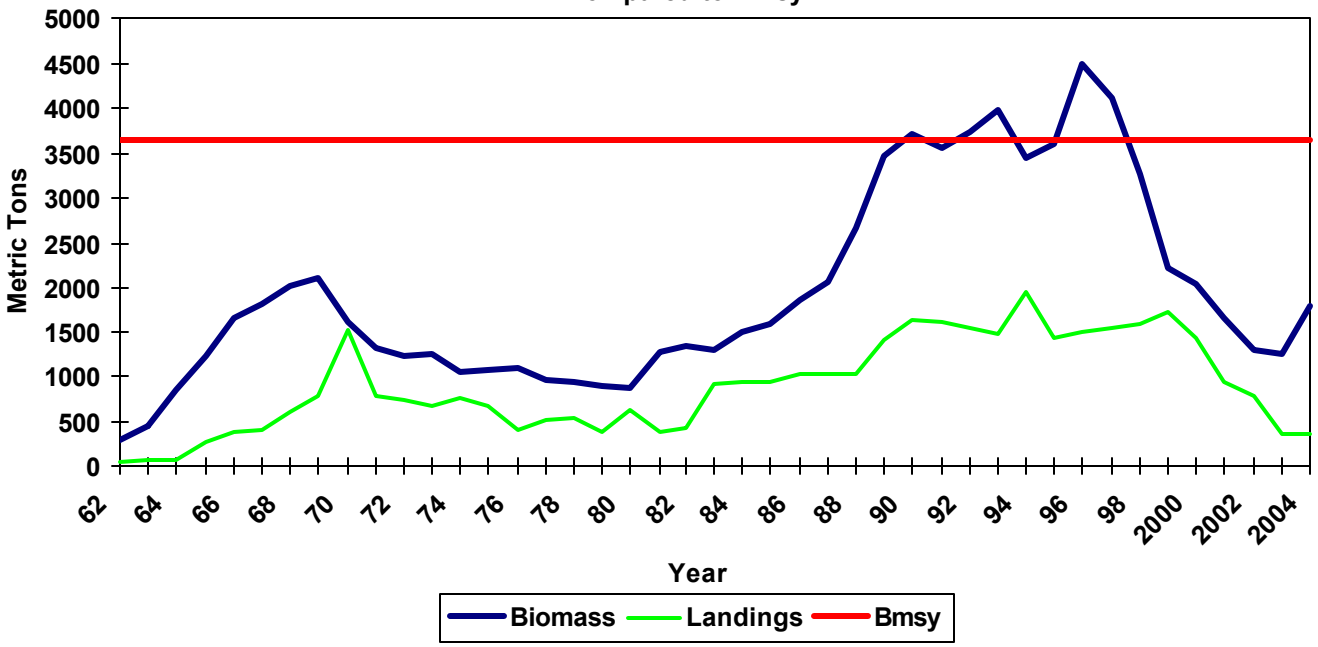

Fig.8- RI Inshore Lobster Stock Abundance and Landings Projection with Status Quo F in 2004. Assumes Normal Stock Productivity

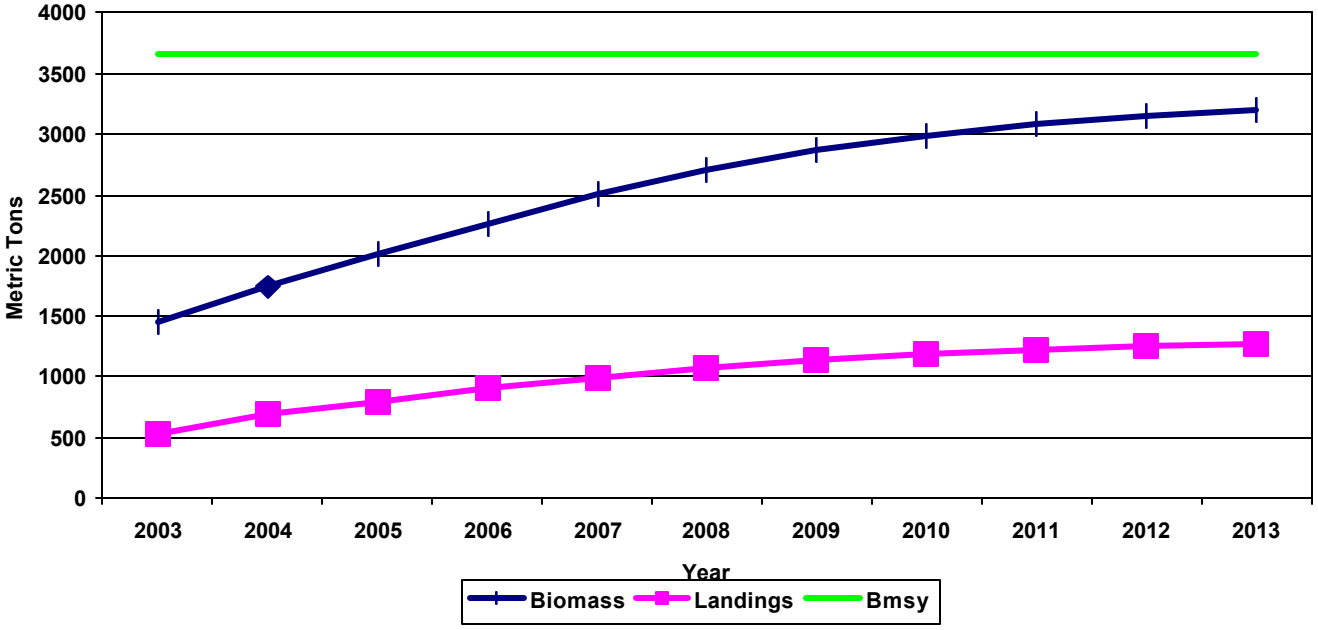

Fig.9- RI Inshore Lobster Stock Abundance and Landings Projection with 50% Reduction in F in 2004. Assumes Normal Stock Productivity

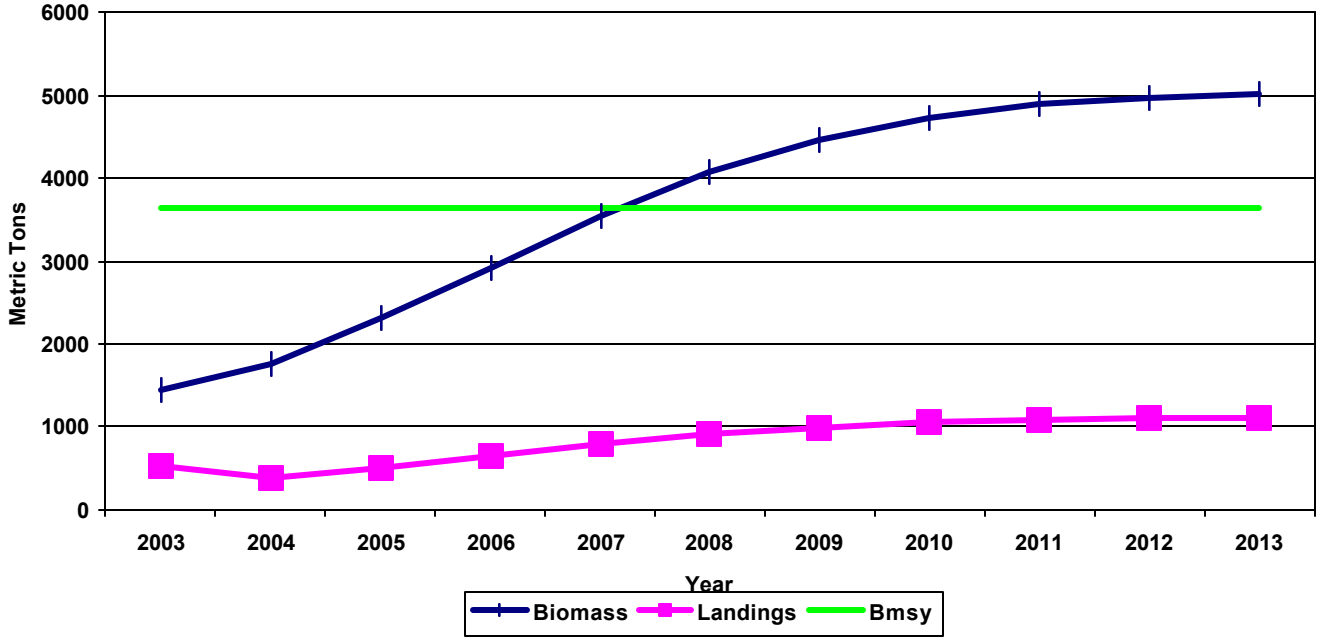

Fig.10- URIGSO Trawl Survey Abundance and Fishery Landings of Cancer Crabs In Rhode Island

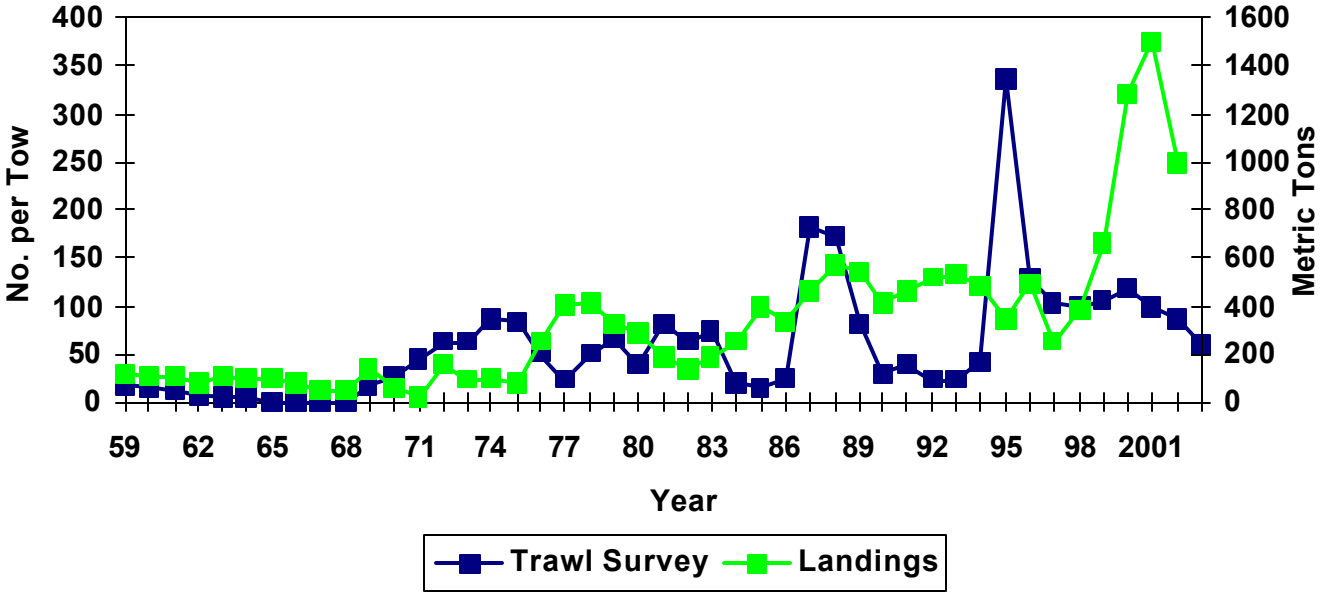

Fig.11- RI Horshoe Crab Fishing Mortality Rate Compared to MSY Reference Level

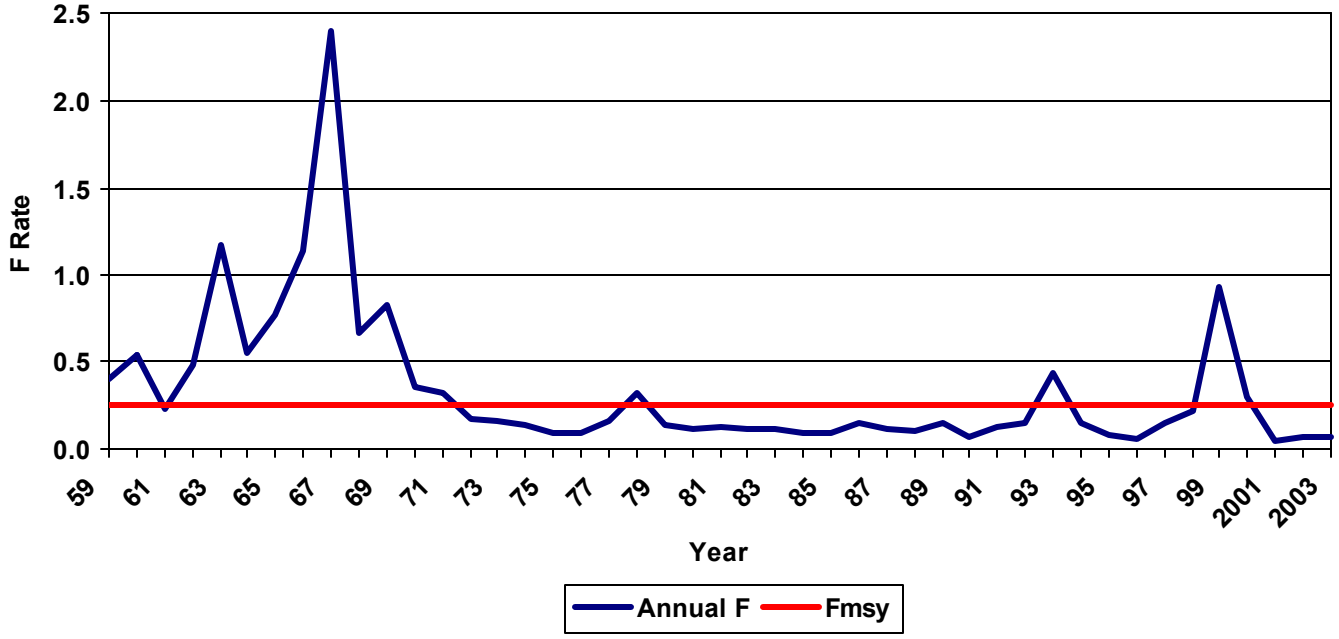

Fig.12- RI Horshoe Crab Abundance and Landings Compared to MSY Reference Level